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Nesting and Incubation Behaviour in Tailor bird (*Orthotomus sutorius*) in Urban Areas of Haryana

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ABSTRACT

Changing habitat and loss of food resources may influence demography through changes in the overall breeding performance of Tailor bird (*Orthotomus sutorius*). Tailor bird is small bird of olive green colour above and white underneath. It nests in April – September when vegetation and insect population is abundant. Nest searches were conducted checking individual bushes or by following nesting-related activities of the parent birds. Tailor bird inhabited light scrub jungle open areas, ploughed fields, grazing lands and cultivated areas close to human habitations and gardens. They utilized cover which provided them sufficient food and water. These habitats provided suitable food and cover to Tailor bird. Egg laying was initiated in late May, with the earliest record of the first egg in the clutch laid in the beginning of May (2014), and it ended by end of July (2014), therefore, the egg-laying period was approximately 4-5 days. Because a nesting cycle (nest building, egg-laying, incubation, pre- and post-fledging care) required nearby 40 days (see below), pairs could not raise more than one brood a year. Only females incubated whereas males provided food to the incubating females. The incubation period, measured as the number of days from the date of the laying of the last egg to the date of the hatching of the first young, ranged from 13 to 14 days. Incubation was started by the female when the last egg of the clutch had been laid.

Keywords: tailor bird, nesting, incubation, clutch size, breeding behavior

INTRODUCTION

Tailor bird (*Orthotomus sutorius*) is small bird of olive green colour dorsally and white underneath. It nests in April – Sep when vegetation and insect population is abundant. Only few details of the reproductive ecology of tailor bird are known, except for the descriptions of a few nesting attempts occurring in the Himalayas (1). There is now considerable evidence that urbanization and agricultural intensification leading to altered land-use has contributed to the decline of many bird species (3). Loss of food resources may impact demography through changes in the overall breeding performance of a species, mediated by reductions in fledging success, nestling body condition or the number of breeding attempts being made during a season, as well as reduction in survival probabilities in the non-breeding season (4).

Tailor bird is a monogamous species and pairing lasts throughout the breeding season. It produces two broods per year. Tailor bird is found to breed in early Apr-Jun as early breeding allows time for second breeding attempt. Early nesting favours chicks breeding twice in year and also availability of food for chicks. In tailor bird both species shows parental care as bird produces atricial young ones to increase the probability of survival of young ones.

METHODS

Field study was done from April 2013 to September 2013 in the District of Ambala and Kurukshetra in the state of Haryana. Nest searches were conducted by checking individual bushes or by following nesting-related activities of the parents. For each nest found, I described the vegetation types, supporting plants and their height, and height

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of the nest from ground. The nest dimensions and nest contents (egg size and nestling mass) were measured.

For all active nests, I estimated the approximate date the first egg was laid based on the average incubation period of known-age young of those complete clutches. Relative occurrence of different shrub species in various habitats was determined from a general vegetation survey in the study area. Nest-searching efforts were not distributed evenly among the habitats. This sampling method limited my ability to quantify nesting preference of the Tailor birds among habitat types. The time spent in various parental activities such as nest attendance, vigilance and egg turning was obtained using time budget data obtained at regular intervals of time.

RESULTS

Nesting habitat

Tailor bird inhabited waste grasslands, dry river banks, mud roof tops cultivated gardens. The proportion of nesting material used in different habitat types was found to be different. They utilized cover, which provided them sufficient food and water. These habitats provided suitable food like ants (Formicidae), termites (Isoptera) and beetles (Coleoptera) and cover to the species. Four different nesting habitats were found in various habitats as shown in Table 1 which had different nesting materials. Mostly preferred nesting habitat was cultivated gardens with maximum percentage of nesting material as mud pieces and small wooden twigs.

NEST

Nest of tailor bird was funnel shaped and formed of cup of soft fibres, cotton threads, wooden twigs and wool in a funnel shape etc. Leaves of large plants were folded and stitched along the edges (Fig. 2 and 3). Three to four eggs were laid in a clutch. Eggs were reddish or bluish white having brownish red spots on them. Both sexes shard duties but female incubated alone.

Egg-laying was initiated in late May, with the earliest record of the first eggs being laid in the beginning of May, and ended in July. Therefore, the egg-laying period was approximately 45 days. Because a nesting cycle (nest building, egg-laying, incubation, pre- and post-fledging care) required nearby 40 days, pairs could not raise more than one brood in one breeding season.

Nests were cup shaped, with an entrance (Mean Diameter ± S.D = 4.4 ± 0.2 cm, Range = 3.4—5.5cm, n = 9) on the top. Mean measurements of nests were as follows: Mean±S.D=11.2 cm±0.8, Range 9. 5—14.0cm, n=18 in external diameter (measured depth from the entrance rim to the bottom of the inner cup) and height (from the entrance rim to the bottom of the outside of the nest) of nest was Mean±S.D=14.0±8.0cm, Range 11.0—15.8cm, n=18. The external walls of nest were constructed mainly of thin grass stems, the bark of Cinquefoil (*Potentilla fruticosa*). Inside the nests were soft materials, mainly feathers of dry weight of with feathers weighing 5.5 g in the heaviest one. Eggs were typically whitish with red- brown spots on both ends. Fresh mass of eight eggs was Mean ± S.D = 1.1 ± 0.03g, range 1.0—1.2g, n=21.

Incubation

Only females incubated while males provided food to the incubating female which passes the food to helpless young ones. Incubation starts after the last egg of clutch had been laid. Nest attendance is the time spent by the

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parent in the nest regarding incubation and brooding activities. Vigilance Egg turning The incubation period, measured as the number of days from the date of the laying of the last egg to the date of the hatching of the first egg, which was 13 to 14 days (Mean±S.D=13.3 ± 0.3 days, Range=13-14 days, n = 23). Tailor bird spent most time in nest attendance as compared to vigilance (taking care of eggs and young ones even when not in nest) and egg turning (rotating to maintain homeothermy) as shown in fig.3. Time spent in egg turning was found to be low as compared to other parental investments.

Discussion

Availability of food resources for rearing young ones is major factor governing nest site selection of birds. The preference of Tailor bird for nesting in gardens may be associated with relatively rich availability of food. Such a nest-site preference may be particularly important for breeding success of small birds (with their especially high thermoregulatory needs) that inhabit cold, food-poor, high-altitude environments (2). The short, thorny, dense bushes in gardens used to facilitate fastening the nests, and protect the nest contents of Tailor bird from predators.

The relatively narrow breeding window (about 13-14 days) normally allows a pair of this species to produce more than one brood. The consistency in breeding season, based on the general view that bird breeding coincides with the time of maximum food abundance for rearing offspring (11). The incubation period of 13–14 days and nestling period of 14–17 days in Tailor bird allows it to raise more than one brood annually. The nesting success of 76% in Tailor bird this could be attributed to lower predation in the gardens and cultivated lands where the main nest predators such as corvids and cuckoo are absent.

Maintaining homeothermy of eggs is another challenge faced by the breeding birds. Belly soaking and egg wetting have been reported in the small Indian Pranticole (*Glareola lacteal*), Black winged Stilt (*Himantopus himantopus*), Kentish Plover *(Charadrius alexandrinus*) (7). But such type of egg wetting was not observed in Tailor bird as eggs are covered in dense vegetation and less exposed to sunrays. In great Tit (*Parus major*) variation in parental incubation pattern were induced by changes in the air temperature. With rise in temperature duration of incubation is decreased, whereas with decrease in temperature duration of incubation is increased (6). Hatching success was found to be in waste grasslands, as compared to Roof top. With regards to season the nesting success declined as the season progressed in various habitats. Due to non-existence of grazing cattles in cultivated gardens nesting success was more (4). The nesting success decreased with progress of breeding season due to rains which causes flooding of nesting sites (12).

The amount of food available for egg-laying females is considered as an important proximate factor determining the breeding onset (10). Tailor bird rely mostly on coleopteran and Lepidoptera larvae when provisioning nestlings (Daunt, 2005). Coleoptera and Lepidoptera larvae develop during the February, reach peak biomass in March and abundant in in april-may which is major food for nestlings of tailor bird (16). Thus, environmental temperature has been postulated as an important proximate factor determining the onset of breeding. Low temperatures seem to impose a direct

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energetic limitation on laying females, reducing egg size (9).

Passerines by the larger clutch size in species nesting in cavities tree tops, which are less exposed to nest predation (14) showed that, if predation pressure is high enough, natural selection could favour clutch size limitation. But clutch size may be limited by the amount of resources available to the laying female (13). Early nesting favors breeding twice year and availability of food for chicks as they become capable of feeding and foraging before onset of winters. Chicks develop rapidly as weather becomes warmer and food supply increases (8). Increase in temperature in months of may-June increases availability of food supply for nestlings and in turn increases chances of their survival.

Table 1. Percentage of nesting material in nests of different habitats.

Habitat types	Grass	Twigs	Dry leaves	Mud pieces	Gravel
Waste Grasslands	1.3	31.2	1.3	28.6	23.8
Cultivated gardens	11.4	20.5	11.4	43.2	9.1
Dry river banks	0	36.4	0	0	45.5
Mud roof tops	0	0	0	20.0	40.0

Fig. 1 Nest of tailor bird

Fig. 2 Tailor Bird Nest (Front view)

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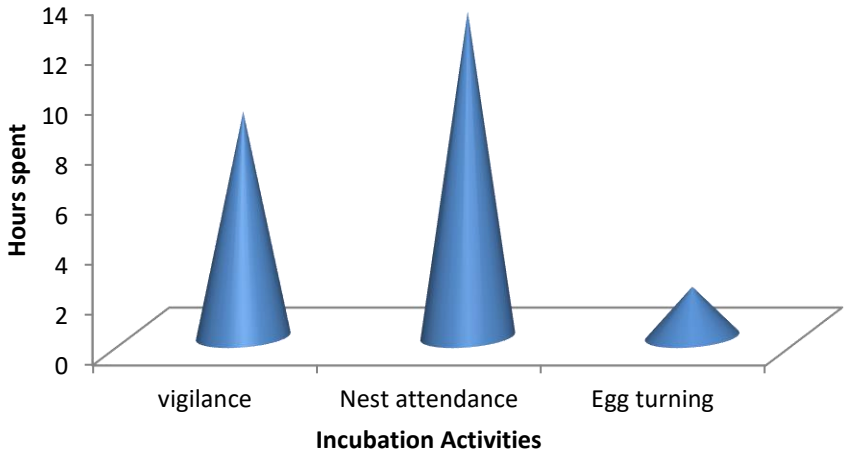

Fig. 3 Parental activities shown by Tailor Bird during Incubation

CONCLUSION

Tailor bird inhabited waste grasslands, dry river banks, mud roof tops cultivated gardens which provided them sufficient food and water. Mostly preferred nesting habitat was cultivated gardens with maximum percentage of nesting material as mud pieces and small wooden twigs. Tailor bird nest is funnel shaped and formed of cup of soft fibers, cotton threads, wooden twigs and wool in a funnel shape etc. Leaves of large plants were folded and stitched in such a way that provide concealment to eggs and chicks from all sides. Three to four eggs were laid in a clutch and female spent most time in nest attendance as compared to vigilance and egg turning. Time spent in egg turning was found to be low as compared to other parental investments because nesting habitat selected by Tailor bird helps to maintain homeothermy of eggs.

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